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UNIDO POLICIES: UNIDO ENERGY PROGRAMME

Revised proposal by the Director-General

Summary

In accordance with Board decision IDB.8/Dec.12 and on the basis of consultations with Member States, revises document IDB.8/9 and submits to the Board for approval a new energy programme formulated within the mandate of UNIDO. The present document, in particular chapters I to III should be read in conjunction with document IDB.8/9, chapters I to III.

CONTENTS

	Paragraphs	Page
Introduction	1 - 2	1
Chapter		
I. FRAMING AN ENERGY POLICY FOR UNIDO: BASIC CONSIDERATIONS	3 - 14	1
II. CURRENT ENERGY-RELATED ACTIVITIES OF UNIDO	15 - 16	3
III. OBJECTIVES OF THE PROGRAMME	17 - 20	3
IV. THE PROPOSED PROGRAMME: OUTPUT AND ACTIVITIES	21 - 43	4
V. IMPLEMENTATION ARRANGEMENTS AND RESOURCE REQUIREMENTS	44 - 48	7
VI. ACTION REQUIRED OF THE BOARD	49	8
Notes		8

Introduction

1. The Industrial Development Board, at its sixth session, approved the proposed UNIDO environment programme as outlined in document IDB.6/3, paragraphs 3 to 28, by its decision IDB.6/Dec.7. Subsequently, the Board at its seventh session requested the Director-General (IDB.7/Dec.14, para. (k)) to identify, as appropriate, extrabudgetary resources for the implementation of the environment programme and to present to the policy-making organs for approval the energy programme proposed for the 1992-1993 biennium (IDB.7/7, paras. 67-76, draft medium-term plan, 1992-1997 and PBC.7/17, paras. 69-81, revised draft medium-term plan). The proposed programme was submitted to the Board at its eighth session in document IDB.8/9. The Board, in decision IDB.8/Dec.12, requested the Director-General to revise and resubmit the proposed energy programme to the ninth session of the Board taking into account a number of considerations.

2. As in the previous proposal (IDB.8/9, para. 2), the present document outlines basic considerations for the formulation of an energy programme for UNIDO. These are described in chapter I of the present document; references are given, when appropriate, to the basic considerations listed in IDB.8/9, chapter I. Energy-related activities are noted mainly in IDB.8/9, chapter II, and a brief update is provided in chapter II of the present document. As requested by the Board in decision IDB.8/Dec.12, revisions have been made and new elements included in the proposed energy programme, and these appear mainly in chapters III to V of the present document ("Objectives of the Programme", "The Proposed Programme: Output and Activities", and "Implementation Arrangements and Resource Requirements").

I. FRAMING AN ENERGY POLICY FOR UNIDO: BASIC CONSIDERATIONS

3. The world-wide energy situation, the energy needs of the developing countries, the impacts of

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energy growth in developing countries and the relationship of energy to industrial growth are basic considerations for the development of a UNIDO energy programme. They form the basis for developing UNIDO's role in assisting industrial development with respect to energy growth and conservation which is delineated in the present document. The subject was elaborated in IDB.8/9 (chap. I). The Board, when requesting a revision of the proposed energy programme in its decision IDB.8/Dec.12, emphasized the following considerations:

(i) The need of developing countries to exploit their own indigenous resources to increase their industrial production;

(ii) The need to transfer environmentally sound technologies to developing countries;

(iii) The need of developing countries to develop their capacity to produce energy technologies for industrial development;

(iv) The need by some developing countries to use the energy programme as a framework for industrial energy policy formulation;

(v) The need to avoid duplication of efforts made by other international and regional organizations concerned with energy problems;

(vi) The need to focus on energy for rural industries for developing countries.

4. Energy is the driving force of the global economy and an essential element of human existence. Energy, particularly energy derived from fossil fuels, will continue to play a prominent role in world-wide development, since fuel reserves are abundant and could last for many decades to come. Fossil fuels constituted 80 per cent of the energy produced in 1989. Within fossil fuels, 40 per cent of the energy produced was from oil, 35 per cent from coal and 25 per cent from gas. However, the ultimate availability of those energy resources and the size of recoverable fossil energy reserves (i.e. resources that are recoverable at competitive prices) change with price levels, recovery technology developments, geopolitical conditions and other factors. At current production levels, the non-renewable conventional energy resource base (i.e. identified as well as undiscovered reserves) could last for more than 70 years for crude oil and more than 100 and 600 years for natural gas and coal, respectively.

5. The annual contribution of renewable sources of energy (including firewood) represents about 13 to 14 per cent of total energy supplies. Precise figures on the production of renewable energy, in particular traditional sources, however, are not easily available. On the basis of available data, the share of renewable energy sources in developing regions has remained largely unchanged between 1980 and 1985. In those regions, renewable sources of energy provide one third of consumed energy - approximately 57 per cent of energy consumed in Africa, 38 per cent in Latin America, and 20 per cent in Asia and the Pacific. 1/ During the first half of the 1980s, progress in renewable sources of energy centred on the large-scale application of technologies that were fully developed such as hydropower and geothermal electricity. Solar thermal technologies and wind electric farms have now reached commercial status. Yet although numerous activities have taken place on small-scale renewable applications, their overall impact on the global availability of energy remains insignificant. Small-scale hydropower, for which no data was available in 1981, now represents a measurable amount of energy supply. Geothermal energy production increased by 60 per cent during the period 1980-1985, and has increased further between 1986 and 1990. While global resources of geothermal energy are limited, it could play a significant role in specific regional and local areas. The contributions of other renewable energy sources, in particular wind and solar power, are expanding. The total estimated resource base of both these energy sources is immense and outstrips the world's total energy requirements. However, at present only a small fraction of this dispersed energy is captured and used to generate electricity. The future contribution of solar and wind energy will depend largely on the success of R and D efforts to increase the efficiency of those technologies and reduce the associated costs.

6. The output of alcohol for energy purposes has nearly tripled since 1980, mainly due to the rapid expansion of the Brazilian programme of gasoline substitution. Energy from bagasse increased by some 53 per cent during the period 1980-1985 and is used in the form of steam and process heat by the sugar industry, as well as for electricity generation. Traditional sources of energy, which include fuelwood, charcoal, draught animal power and agricultural and animal residues, represent the largest share among new and renewable sources of energy. Energy supplies from fuelwood and charcoal are estimated to have provided the equivalent of over 500 million metric tons of oil in 1985 and 377 million in 1990, according to the International Energy Agency World Energy Statistics (1991). The increased use of fuelwood, charcoal and agricultural/animal residues for energy in developing countries, however, leads to a deterioration in living and environmental conditions.

7. Population growth will remain a major factor in energy demand, in particular in developing countries. It will in all probability be matched by an increasing demand for satisfaction of basic needs. The world's population has doubled over the past 40 years, and it is expected to double again by the middle of the next century. By the year 2050, the population in developing countries will probably number more than 9 billion as against less than 4 billion in 1988, bringing excessive pressure to bear on future energy demand and supply patterns, quite apart from the additional demand for improvements in satisfying basic needs.

8. Demand for energy will grow most rapidly in the developing countries, particularly if their economic growth targets can be realized. The rate of growth of commercial energy consumption in developing countries averaged 5.5 per cent per annum during 1974-1989 compared to 5.3 per cent during 1960-1973, despite the fact that the rate of their annual GDP growth had dropped to an average of 3.7 per cent from 5.6 per cent during the corresponding period. As a result, energy

intensity (barrels of oil equivalent (boe)/$1,000 GDP) in those countries rose to nearly 1.5 for 1974-1989 from 0.95 for 1960-1973. 2/ Nevertheless, the level of per capita commercial energy consumption in developing countries remains very low. In Africa, energy consumption was 178 kg of coal equivalent in 1989 compared with 455 kg for developing countries in Asia and 2,160 kg for Latin America. The corresponding figure for the United States of America in 1989 was 7,090 kg. However, the consumption of traditional energy sources, which are not included in these figures, played an important role in the energy consumption of most developing countries. They will require increasing amounts of energy in order to continue to grow economically, and conservation, while important, cannot offset the need for new and increased energy supplies which will include rural areas where women play a major part in the utilization of energy for domestic use.

9. The energy growth in developing countries will be impacted by several factors, including the costs of providing energy to and for industry, the ability of developing countries to optimize the use of energy, the availability of foreign exchange currency, and that of appropriate technologies, energy policies and environmental considerations. (Ref. IDB.8/9, paras. 5-7)

10. The equipment needed for the optimization and production of energy tends to be capital-intensive, requiring special assistance in planning and selecting systems to realize an efficient mix of options. This will apply to the development of appliances that conserve natural energy resources as well as new industrial equipment. (Ref. also IDB.8/9, paras. 9-10)

11. The design and manufacture of local equipment including energy-efficient appliances is a key development area. This is of particular importance to the developing countries because traditional equipment manufacturers and suppliers from the industrialized countries do not necessarily produce the types of equipment best suited for developing countries.

Conclusions

12. Global energy balances, together with the realities of pricing and production policies of the Organization of Petroleum Exporting Countries, imply that the energy required can be supplied at essentially constant prices (discounting inflation). Even though energy prices may not increase, the unavailability of foreign exchange calls for financial and technical support to developing countries by international aid agencies for adapting and applying environmentally sound technologies and to permit application of domestic energy resources while respecting environmental issues.

13. Some developing countries possess untapped potential in new and renewable sources of energy, like biomass, thermal and solar energy. Others, while having under-exploited deposits of low-grade coals, are meeting their energy needs with small hydro-powered or wind-generated plants. Extensive technical assistance will be required in those countries to diversify their energy base to exploit all reasonable technologies and fuels.

14. The UNIDO energy programme will focus on providing assistance to developing countries in the area of industrial energy development and power generation so as to minimize the rise in per capita energy consumption rates and enable those countries to reach a stage of optimized industrialization at a reasonable level of per capita energy consumption and with acceptable environmental consequences. This will be accomplished by:

(a) Increasing awareness of management/ government in developing countries to energy options through seminars and capacity building;

(b) Applying technology to developing-country infrastructure including the establishment of industry-related R and D institutions, the introduction of new and alternate technologies into manufacturing, and the establishment of maintenance and repair capabilities; and

(c) Introducing effective technology transfer, including seminars to keep participants updated in technology issues, and the replacement of outgoing UNIDO staff with advanced energy technology expertise.

II. CURRENT ENERGY-RELATED ACTIVITIES OF UNIDO

15. Examples of energy-related activities of UNIDO are described in IDB.8/9, chapter II, paragraphs 37 to 52. In addition to undertaking projects on wind and solar energy, small hydro-power plants and biomass, workshops have been set up on energy management and conservation methods.

16. Comprehensive programmes on energy management are foreseen in the form of regional centres. They will include traditional sources of energy such as crude oil, coal and natural gas and also renewable sources of energy such as biomass, wind, geothermal and solar. The proposed regional centres will operate a database, carry out energy-related monitoring activities, and provide training using workshops for spare parts and equipment maintenance training. All services required for the development of environment-friendly sustainable industrial growth in the chemical and petrochemical sectors will be provided. For example, as a follow-up to the technical assistance provided since 1985 to the Regional Petroleum Training Centre in Angola (see IDB.8/9, para. 44), a project for a regional centre in energy management and environment for the ten other SADCC (Southern African Development Coordination Conference) countries is currently under discussion and preparatory assistance has been formulated. Similarly, projects will be prepared for a homogeneous group of countries in the Asia-Pacific and Latin America-Caribbean regions.

III. OBJECTIVES OF THE PROGRAMME

17. As can be seen from the examples in chapter II of the present document as well as those referred to in IDB.8/9, chapter III, energy has long been an important aspect of UNIDO activities (Ref. IDB.8/9, para. 54). Consequently the energy programme will not introduce any major new elements to what is already an important component of UNIDO's work. Rather it will constitute a

focusing of efforts for the purpose of increasing effeciency and maximizing impact. The proposed programme is designed to strengthen relevant ongoing activities by focusing UNIDO efforts on key "areas of opportunity" and to ensure that future energy-related activities of UNIDO (a) reflect the basic links between energy supply, sustainable economic growth, and the environment and (b) embody the increasing concerns world wide for environmental protection.

18. The UNIDO energy programme proposed in the present document is based on the following key issues that are relevant to the needs of developing countries:

(a) The current inefficient power generation and energy usage in developing countries;

(b) The need for clear energy policies and up-to-date technical information on energy alternatives in developing countries including environmental emission controls within the industrial sector;

(c) The need for technical assessments of the industrial sector to identify the technology appropriate for the level of development in developing countries;

(d) The need for production facilities to develop and manufacture energy technologies and equipment locally in developing countries;

(e) The difficulties of importing technologies or clean fuels in developing countries;

(f) The need for transfer of environmentally mitigating technologies to developing countries under concessionary terms; and

(g) The need for a stronger linkage between industrial research and development and industrial commercialization.

19. The proposed UNIDO energy programme will provide a new focus for ongoing UNIDO activities relating to energy and industry and ensure that energy projects take into account the need for ecologically sustainable industrial development, the maximum use of indigenous resources as well as energy conservation. Within the broad objective, subsidiary objectives have been identified which will be incorporated in the planning and execution of future energy projects.

20. The methodology employed to accomplish those objectives is described in detail in paragraph 58 of IDB.8/9, and referred to briefly below with minor revisions:

(a) Focus on technologies or options where existing indigenous markets are least able to develop the solutions;

(b) Identification and promotion of technology options that optimize per unit energy use in the industrial processes. It is necessary to assess the complete manufacturing/production cycle for optimized energy use;

(c) Emphasis on those projects with the most promising near-term prospects for commercialization;

(d) Concentration on methods for more systematically demonstrating and promulgating energy technologies in order to maximize the "multiplier" or "demonstration" effects;

(e) Factoring realistic energy cost projections into feasibility studies for both energy conservation and technology transfer projects;

(f) Integration of environmental considerations into energy projects. Both the environmental impacts and the costs of environmental protection will be considered and incorporated into energy-related projects;

(g) Cooperation in energy activities with other United Nations organizations.

IV. THE PROPOSED PROGRAMME: OUTPUT AND ACTIVITIES

21. The proposed UNIDO energy programme is designed to meet the special needs of the developing countries with respect to the supply and use of energy. It is based upon adapting UNIDO's current capabilities to those energy issues which are of special importance to the developing countries. In particular it addresses the trade-offs between environmental concerns and the compelling need for energy to fuel sustained economic growth.

22. The programme consists of four identifiable subprogrammes which will be executed in parallel e.g., all four subprogrammes will be operational at the same time.

Subprogramme I: Enhancing UNIDO's capacity to provide support to energy-related aspects of industrial development

I.1. Problem to be addressed

23. The growing complexities and the impact of industry on the environment as it relates to energy use and the need for increasingly diversified technical assistance to alleviate that impact make it essential that energy considerations be incorporated in the development, appraisal, implementation and evaluation of UNIDO projects and that adequate expertise exists in the Organization to provide the requisite assistance to the developing countries.

I.2. Objective

24. Through capacity building, including seminars to maintain up-to-date knowledge in technology, the replacement of outgoing staff with those having technical energy-related skills and the expansion of the project database, to increase the capacity of UNIDO to provide effective energy technology-related assistance and to develop and apply appropriate project development and implementation tools relating to advanced energy-efficient technologies.

I.3. Subprogramme focus

25. Strengthening UNIDO's capabilities in the fields of technological know-how of industrial energy conservation, efficiency, and technology options; definition and implementation of alternate technology projects and policies regarding energy matters, including development of a core group of staff having the required understanding and appreciation of new technologies.

I.4. Output

26. (a) Consolidated and supplemented in-house guidelines and information regarding the energy aspects of project design and appraisal, energy system evaluations, and project implementation;

(b) Improved coordination among the different units at UNIDO concerned with energy issues by creating ad hoc working groups, developing energy databases and training packages, but without adding any new staff or reporting structure. Expert group meetings will be organized to assist;

(c) Increased staff awareness of issues relating to the impact of energy on the industrialization process in developing countries and energy technology options available to address these issues;

(d) Enhanced database with the capability to identify projects by their energy-related content;

(e) Modified Computer Model for Feasibility Analysis and Reporting (COMFAR) incorporating a module on energy systems analysis as part of pre-investment studies of industrial projects and assessments of operating costs;

(f) A core of qualified UNIDO staff involved with the project cycle and familiar with the latest developments and trends in new environmental benign fossil and new and renewable energy technologies; and

(g) Established collaboration with related regional, international or multinational agencies in complementary areas to avoid duplication of effort. International organizations will include those with energy- and environment-related mandates, such as the International Atomic Energy Agency and the United Nations Development Programme, as well as those indirectly concerned with energy, such as the World Bank.

I.5. Activities

27. (a) Hold expert group meetings to define energy-related project tools and guidelines;

(b) Develop guidelines on evaluation and the incorporation of high-efficiency energy systems in industrial cooperation projects, drawing on information from and experience of national and international organizations and agencies and Government energy departments, as necessary;

(c) Establish energy keywords in the UNIDO project database;

(d) Identify and implement tools to assess the economic impact of high-efficiency and alternate energy systems on investment and operating costs in defined industrial sectors;

(e) Review project proposals for energy content and modify database to record/monitor projects using energy keywords;

(f) Conduct seminars on energy system alternatives for UNIDO staff concerned with technical cooperation and promotion activities; and

(g) Establish ad hoc working groups in-house to explore areas of mutual interest and capabilities in the energy area and to ensure that the energy aspects of projects are addressed and understood.

Subprogramme II: Assistance to developing countries in developing industry-related energy systems

II.1. Problem to be addressed

28. Developing countries could make a decisive contribution to world energy conservation as well as protection of the environment by using high-efficiency advanced energy technologies within their own borders. Yet many developing countries lack sufficient experience and technical information to select the proper technologies as well as the necessary institutional infrastructure to appraise the impact on industry of energy growth related to their level of development.

II.2. Objective

29. To enhance capabilities of developing countries to conduct industry-related energy technology assessments and to assist them in formulating and implementing energy programmes and projects in energy intensive industrial sectors including energy transport and energy efficient appliances.

II.3. Subprogramme focus

30. Focus on the energy-intensive industries in developing countries to include industrial subsectors and power generation plants using indigenous fuels (coal, oil, natural gas), the energy transport sector and appliances that allow conservation of natural resources.

31. Focus on assessing and applying cost-effective high-efficiency energy technologies using local natural resources while minimizing any environmental impact. Such technologies must be appropriate for a particular country and incorporate the use of oil and natural gas where economically feasible.

II.4. Output

32. (a) Completed programmes to train developing country cadres in energy system planning for industry (in particular, system assessments) and in formulating industry-related programmes and projects, including energy transport;

(b) The ability of developing countries to select an optimum mix of energy resources for their industrial sectors from available options, particularly as regards the location of new industries and energy resource planning with the focus on exploiting indigenous resources;

(c) Advisory projects to assess effective energy utilization in specific industrial plants within the requesting developing countries. This will include assisting countries to apply true energy costs based on world energy prices and optimizing per unit energy use in industry;

(d) Technical assistance to developing countries on selection of technologies including evaluation of tenders for energy-related equipment and systems and developing a linkage between R and D and industry; and

(e) Methods, manuals and information on evaluating cost-effective energy systems.

II.5. Activities

33. (a) Provide advice and training to the Governments of the developing countries in formulating programes and projects for industrial energy use and conservation;

(b) Conduct feasibility studies on energy use/production and alternative technologies available to alleviate inefficiencies in industry, focusing on indigenous resources and optimizing per unit energy use on a total system basis. Expand investment forums to include alternate technologies;

(c) Develop databases and guidelines for introducing energy-efficient systems in industrial enterprises in cooperation with other agencies to optimize energy conservation in industry and the development of efficient appliances that minimize the use of natural resources; and

(d) Disseminate manuals and information on methodology for evaluating energy systems in cooperation with other United Nations agencies.

Subprogramme III: Sustainable energy development and utilization

III.1. Problem to be addressed

34. Developing countries are currently not exploiting and utilizing locally available energy resources in an environmentally-sound manner or with any emphasis on per capita energy consumption rates and, specifically, energy conservation. They have failed to take full advantage of local fuels and to use experience gained elsewhere concerning utilization of those fuels. This is especially true in the area of rural development.

III.2. Objective

35. UNIDO will assist the development of energy alternatives based on locally available resources, help to raise the level of development in developing countries and to encourage regional economic analyses. Energy alternatives will include fossil fuels, biomass energy, particularly agricultural and forest industry wastes, as well as utilization of low-grade coal which in many developing countries constitutes a valuable source of local fuel. Technology transfer including R and D results will be encouraged between developing countries.

III.3. Subprogramme focus

36. Focus on the identification, assessment, and introduction of energy alternatives to developing countries including the use of indigenous fuels and alternate technologies through R and D activities and demonstration projects. This will include involving women in the sector of rural domestic energy applications and applying energy conservation techniques wherever applicable.

III.4. Output

37. (a) Identification of industrial projects which promise significant energy conservation potential and exploitation of indigenous fuels. Emphasis on environmental aspects as well as energy to maximize joint benefits;

(b) Audits and assessments of industrial sectors to establish methods to optimize the use of indigenous fuels and per unit energy consumption rates in developing countries;

(c) Promotion of alternate energy technology and industrial conservation options within the industrial sector of developing countries; and

(d) Development of projects with a focus on rural energy development and use, especially those benefiting women in the domestic environment.

III.5. Activities

38. (a) Conduct feasibility studies and assessments of industrial subsectors to identify those sectors where the maximum impact of industrial energy conservation can be expected;

(b) Identify and implement projects which include the collateral results of higher efficiency and a reduction in emissions and pollutants;

(c) Conduct workshops for developing countries on alternate energy technologies and fuels that provide increased industrial energy production efficiencies and rural energy systems; and

(d) Develop concepts and projects that develop rural energy systems to assist women in their domestic energy-related tasks.

Subprogramme IV: Industry for energy

IV.1. Problem to be addressed

39. As energy demand in developing countries increases, there is often a need for new industries related to energy systems and equipment. Developing countries often lack the resources to develop a manufacturing capability that enables the manufacture of equipment for energy systems locally or for the application of local new and renewable energy systems effectively in rural areas.

IV.2. Objective

40. To increase the application of conventional fossil fuel combustion techniques as well as advanced and alternate energy technologies within developing countries by establishing or expanding the manufacturing infrastructure to build and repair these technologies and to apply energy systems to rural areas.

IV.3. Subprogramme focus

41. Industries capable of manufacturing and maintaining new and alternate technologies or related equipment within the country and applying that equipment in rural settings.

IV.4. Output

42. (a) Established centres of excellence at the international and regional levels for developing manufacturing techniques for alternate and renewable energy systems, building on the experience already gained in the areas of small hydro-power, solar, wind, and geothermal energy;

(b) R and D projects in alternate technologies relevant to the energy sector and industrial energy conservation; and

(c) Capability within developing countries for the expansion of local manufacture, maintenance and repair of energy equipment including that of rural industries.

IV.5. Activities

43. (a) Promote centres of excellence at the international and regional levels;

(b) Develop R and D industry-related projects in technologies relevant to alternate and renewable energy systems;

(c) Assist and advise on setting up a capability for the local/rural manufacture of energy equipment; and

(d) Assist in the establishment of local capabilities in repair and maintenance for energy equipment.

V. IMPLEMENTATION ARRANGEMENTS AND RESOURCE REQUIREMENTS

Implementation arrangements

44. The basic principle is one of inter-departmental and inter-agency cooperation in rendering effective assistance to the developing countries on specific energy issues and problems. To that end, it would be necessary to set up coordination activities within the Organization - in addition to standard in-house and inter-agency coordination - that should be primarily engaged in programme development and promotion, project development, resource mobilization, and cooperation with development finance institutions with regard to energy matters. Coordination activities would contribute to the identification of new project opportunities arising from the integration of optimized energy technology criteria into the production system. The development and implementation of projects would be the responsibility of the technical units in the substantive Departments.

45. In carrying out these tasks, coordination activities would include:

(a) Supporting Area Programmes staff and in-house technical staff active in the subsectors identified in the proposed programme;

(b) Drawing on consultant resources in industrial areas identified in the proposed programme so as to supplement in-house capabilities and provide the requisite expertise to the developing countries in programme and project development;

(c) Ensuring the appropriate involvement of relevant non-governmental organizations and research institutions;

(d) Ensuring the effective coordination of the efforts of UNIDO with those of other United Nations agencies, especially UNDP and the United Nations Department of Economic and Social Development in the interests of reducing duplication and securing the fullest contribution of UNIDO to forthcoming activities on energy development and use; and

(e) Reporting regularly to the Industrial Development Board and the General Conference on progress made towards the implementation of the UNIDO energy programme.

Resource requirements

46. The proposed programme would be funded in two ways:

(a) Resources, when available, from the regular budget and operational budget; and

(b) Special-purpose contributions to the Industrial Development Fund.

47. Activities under the energy programme will be primarily undertaken within the existing scope of project activities and thus additional funding requirements will be minimal. The programme represents a refocusing of approach and thinking regarding the energy activities within UNIDO projects.

48. An indication of funds required to initiate the proposed programme is given in the table below. The large majority of funds would come from project proposal funding. Experts to assist in the development of supporting technical data and the preparation of programme proposals, and the formulation of needs in the area of resource development in developing countries would be financed from voluntary contributions.

VI. ACTION REQUIRED OF THE BOARD

49. The Industrial Development Board may wish:

(a) To approve the proposed energy programme of UNIDO and its activities as outlined in chapters IV and V above;

(b) To take note of the proposed funding of the programme through:

(i) Regular budget allocations;

(ii) Special-purpose contributions to the Industrial Development Fund;

(c) To call upon Member States to make voluntary contributions to the programme.

Funds required to implement the proposed energy programme in the biennium 1992-1993

(In US dollars)

Subprogramme	Consultants	Meetings	Travel	Total
I	20,000	10,000	20,000	50,000
II	30,000		25,000	55,000
III	40,000		30,000	70,000
IV	35,000		55,000	90,000
	125,000	10,000	130,000	265,000

Notes

1/ United Nations Intergovernmental Expert Group on New and Renewable Sources of Energy, New York, NY, 26-30 August 1991.

2/ IEA/IAEA Senior Expert Symposium on Electricity and the Environment, Helsinki, Finland, 13-17 May 1991.